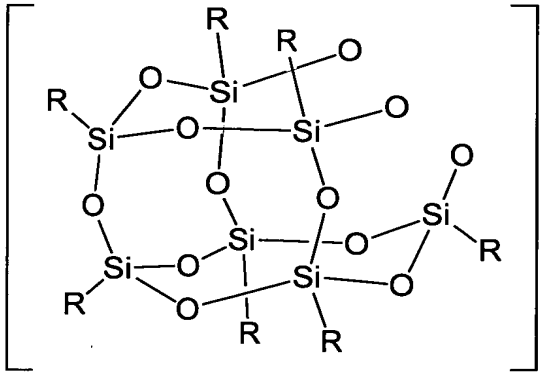
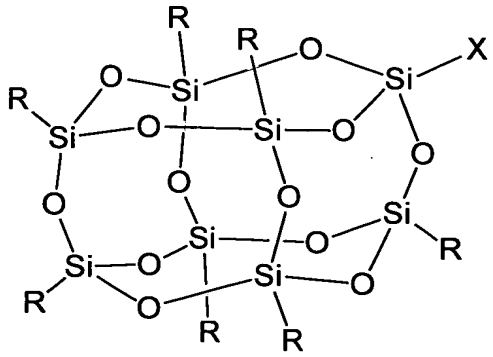
CLAIMS

1. A production process for a silsesquioxane derivative represented by Formula (2), characterized by using a silicon compound represented by Formula (1):



• 3M (1)



(2)

wherein in Formula (1), each of R's is a group selected independently from hydrogen, the group of alkyls having 1 to 45 carbon atoms, the group of substituted or non-substituted aryls and the group of substituted or non-substituted arylalkyls; in the alkyl having 1 to 45 carbon atoms, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -

CH=CH-, cycloalkylene or cycloalkenylene; in alkylene of the substituted or non-substituted arylalkyl, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene; and M is a monovalent alkaline metal atom;

in Formula (2), R has the same meaning as that of R in Formula (1); and X is hydrogen, chlorine, a functional group or a group having a functional group;

provided that X is not any of a group having a hydroxy group which is not bonded directly to Si, a group having alkanoyloxy, a group having halogenated sulfonyl and a group having an α-haloester group.

2. The production process according to claim 1, wherein each of R's in Formula (1) is a group selected independently from hydrogen, the group of alkyls in which the number of carbon atoms is 1 to 20, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of alkenyls in which the number of carbon atoms is 2 to 20, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of alkyls in which the number of carbon atoms is 1 to 10 and at least one $-CH_2-$ is replaced by cycloalkenylene, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1 to 10 carbon atoms, the group of phenylalkyls in which

optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1 to 10 carbon atoms, and naphthyl; in the alkyl having 1 to 10 carbon atoms which is a substituent on the benzene ring, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH-, cycloalkylene or phenylene; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 12 , optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

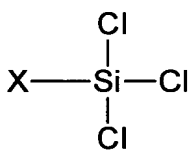
3. The production process according to claim 1, wherein each of R's in Formula (1) is a group selected independently from the group of alkyls in which the number of carbon atoms is 1 to 10, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy, and naphthyl; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 8, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

4. The production process according to claim 1,

wherein all of R's in Formula (1) are the same group selected from the group of alkyls in which the number of carbon atoms is 1 to 10, optional hydrogen may be replaced by fluorine and optional $-CH_2-$ may be replaced by -O- or cycloalkylene, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy, and naphthyl; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 8, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

5. The production process according to any one of claims 1 to 4, wherein M in Formula (1) defined in claim 1 is Na.

6. The production process according to any one of claims 1 to 4, wherein M in Formula (1) defined in claim 1 is Na, and a step for reacting the silicon compound represented by Formula (1) with a silicon compound represented by Formula (3) is included therein:

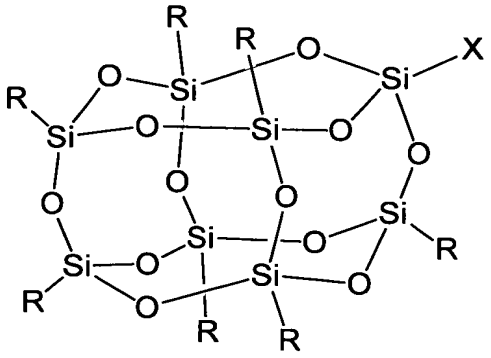


(3)

wherein X has the same meaning as that of X in Formula (2) defined claim 1.

7. The production process according to claim 6, wherein X is hydrogen, chlorine, alkenyl or a group having any of halogen, alkenyl, cycloalkenyl, cyano, alkoxy, phenoxy, acryloyloxy, methacryloyloxy and glycidyloxy;
provided that a group having halogenated sulfonyl and a group having an α-haloester group are not included in the group having halogen.

8. A silsesquioxane derivative represented by Formula (2):



(2)

wherein each of R's is a group selected independently from the group of alkyls in which the number of carbon atoms is 1 to 20, at least one hydrogen is replaced by fluorine and optional $-CH_2-$ may be replaced by -O-, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1

to 10 carbon atoms, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by halogen or alkyl having 1 to 10 carbon atoms, and naphthyl; in the alkyl having 1 to 10 carbon atoms which is a substituent on the benzene ring, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH-, cycloalkylene or phenylene; in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 12, optional hydrogen may be replaced by fluorine, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene; and X is hydrogen, chlorine, a functional group or a group having a functional group;
provided that X is not any of a group having a hydroxy group which is not bonded directly to Si, a group having alkanoyloxy, a group having halogenated sulfonyl and a group having an α-haloester group.

9. The silsesquioxane derivative according to claim 8, wherein each of R's in Formula (2) is a group selected independently from the group of alkyls in which the number of carbon atoms is 1 to 10, at least one hydrogen is replaced by fluorine and optional $-CH_2-$ may be replaced by -O-, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms,

vinyl or methoxy, and naphthyl; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 8, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

10. The silsesquioxane derivative according to claim 8, wherein all of R's are the same group selected from the group of alkyls in which the number of carbon atoms is 1 to 10, at least one hydrogen is replaced by fluorine and optional $-CH_2-$ may be replaced by -O-, the group of phenyls in which optional hydrogen on the benzene ring may be replaced by halogen, methyl or methoxy, the group of phenylalkyls in which optional hydrogen on the benzene ring may be replaced by fluorine, alkyl having 1 to 4 carbon atoms, vinyl or methoxy, and naphthyl; and in alkylene of the phenylalkyl, the number of carbon atoms is 1 to 8, and optional $-CH_2-$ may be replaced by -O-, -CH=CH- or cycloalkylene.

11. The silsesquioxane derivative according to claim 8, wherein all of R's are the same alkyl in which the number of carbon atoms is 1 to 10, at least one hydrogen is replaced by fluorine, and one $-CH_2-$ may be replaced by -O-.

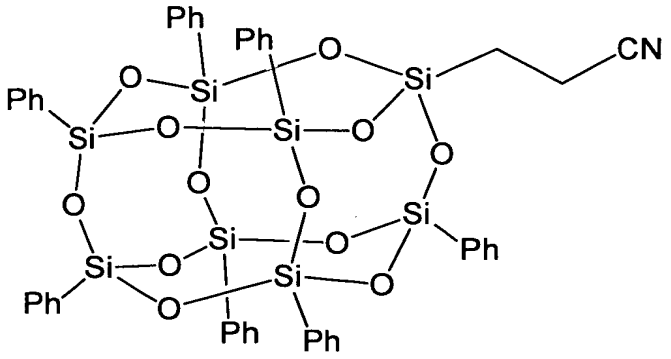
12. The silsesquioxane derivative according to claim 8, wherein all of R's in Formula (2) are phenyl.

13. The silsesquioxane derivative according to claim 8, wherein all of R's in Formula (2) are trifluoropropyl.

14. The silsesquioxane derivative according to claim 8, wherein all of R's in Formula (2) are tridecafluoro-1,1,2,2-tetrahydrooctyl.

15. The silsesquioxane derivative according to any one of claims 8 to 14, wherein X in Formula (2) defined in claim 8 is hydrogen, chlorine, a hydroxy group, alkenyl, or a group having any of halogen, alkoxy, phenoxy, polyalkyleneoxy, -COOH, 2-oxapropane-1,3-dioyl, alkoxycarbonyl, alkenyloxycarbonyl, oxiranyl, 3,4-epoxycyclohexyl, oxetanyl, oxetanylene, -NH-, $-NH_2$, -CN, -NCO, alkenyl, alkynyl, cycloalkenyl, acryloyloxy, methacryloyloxy, -SH and $-PH_2$,
provided that X is not any of a group having a hydroxy group which is not bonded directly to Si, a group having alkanoyloxy, a group having halogenated sulfonyl and a group having an α-haloester group.

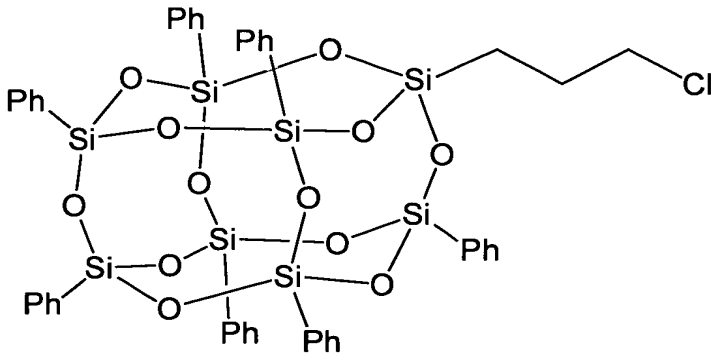
16. A silsesquioxane derivative represented by Formula (5):



(5)

wherein Ph is phenyl.

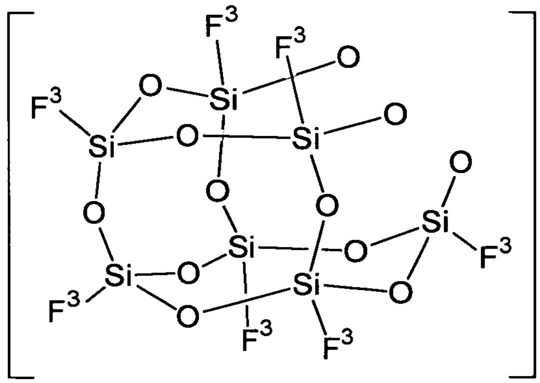
17. A silsesquioxane derivative represented by Formula (6):



(6)

wherein Ph is phenyl.

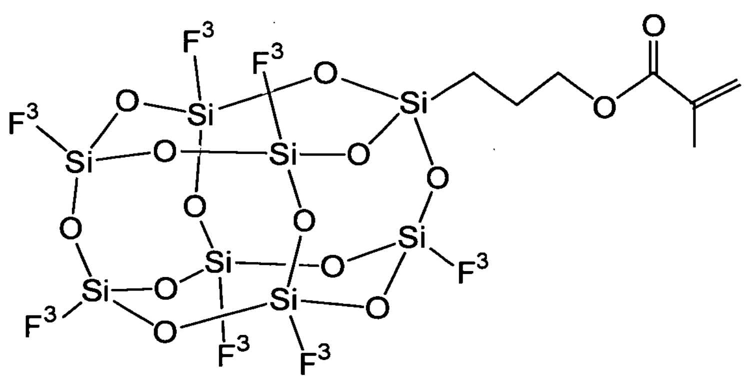
18. A silsesquioxane derivative represented by Formula (1-2):



• 3Na (1-2)

wherein F^3 is $-CH_2CH_2CF_3$.

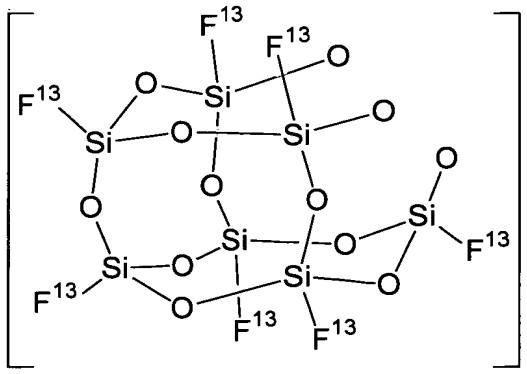
19. A silsesquioxane derivative represented by Formula (14):



(14)

wherein F^3 is $-CH_2CH_2CF_3$.

20. A silsesquioxane derivative represented by Formula (1-5):



• 3Na (1-5)

wherein F^{13} is $-CH_2CH_2(CF_2)_5CF_3$.